



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/226,971	01/08/1999	MICHAEL ANTHONY MARRA III	LE9-98-030	8871

7590

04/08/2002

JOHN J MCARDLE JR  
LEXMARK INTERNATIONAL INC  
INTELLECTUAL PROPERTY LAW DEPT  
740 NEW CIRCLE ROAD NW  
LEXINGTON, KY 40550

EXAMINER
----------

GARLAND, STEVEN R

ART UNIT	PAPER NUMBER
----------	--------------

2125

DATE MAILED: 04/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Paper No. 9

Application Number: 09/226,971  
Filing Date: January 08, 1999  
Appellant(s): MARRA ET AL.

**MAILED**

APR 08 2002

\_\_\_\_\_  
Todd T. Taylor  
For Appellant

Technology Center 2100

EXAMINER'S ANSWER

This is in response to the appeal brief filed 1/31/02.

**(1) Real Party in Interest**

A statement identifying the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) Status of Claims**

The statement of the status of the claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Invention**

The summary of invention contained in the brief is correct.

**(6) Issues**

The appellant's statement of the issues in the brief is correct.

**(7) Grouping of Claims**

Appellant's brief includes a statement that claims 1-3,5, and 8 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

5,212,434	HSIEH	5-1993
4,494,509	LONG	1-1985
6,043,695	O'SULLIVAN	3-2000

Art Unit: 2121

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Hsieh 5,212,434.

Hsieh provides a reference signal ( output of 81) and generates a plurality of digital signals defining a reference pulse train ( output of 82) with a frequency dependent upon the reference signal ( the pulse train output of 82 has a frequency equal to the reference signal frequency divided by  $N_2$  ). Hsieh provides a target system to be regulated (40,50,60) and the target system provides an output in the form of a plurality of digital signals defining a feedback pulse train ( output of 60 ). Hsieh further compares ( at 10 ) the frequency of the reference pulse train ( output of 82 ) with the frequency of the feedback pulse train ( output of 60 ); generates a control signal based on the comparison (output of 31 ); and provides the control signal as an input to the target system.

See figure 1 and note elements 10, 30, 31, 60, 82 and their description. Also note that the frequency output of element 82 is dependent on the control signal output by element 70 and that the pulse output of element 60 is a function of time ( varies with time ).

In response to applicant's arguments, element 10 inherently serves to compare the reference pulse train frequency to the feedback pulse train frequency since to perform phase comparison inherently requires first that the frequencies of the signals being compared be equal so that the phase difference between the two signals can be determined. Otherwise the phase comparison can not be performed since the frequencies of the two signals being compared would not be equal.

Further in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the use of a converter which receives a digital reference signal on line 18 and converts the digital value of the signal to a reference pulse train or the use of a digital PID as applicant argues on page 8 of the brief ) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Also the rejected claims do not require speed control as applicant argues on page 9 of the brief. Applicant also argues that claims 1 and 8 include distinct advantages over Hsieh, these arguments are not considered persuasive. The simple choice of whether the circuitry of Hsieh is implemented using a microprocessor or discrete circuitry can have a major impact on the space requirement and cost. Further the power requirements to drive the step motor and the location of the control circuitry relative to the motor can dictate the space requirements and associated costs. As to the noise argument, the choice of the pulse rate used can have a major impact on the noise

Art Unit: 2121

immunity given that a stepper motor is being used in Hsieh and RF ( radio frequency ) interference could be generated.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2 , 3, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh 5,212,434 in view of either Long 4,494,509 or O'Sullivan 6,043,695.

Hsieh provides a reference signal ( output of 81) and generates a plurality of digital signals defining a reference pulse train ( output of 82) with a frequency dependent upon the reference signal ( the pulse train output of 82 has a frequency equal to the reference signal frequency divided by  $N_2$  ). Hsieh provides a target system to be regulated (40,50,60) and the target system provides an output in the form of a plurality of digital signals defining a feedback pulse train ( output of 60 ). Hsieh

Art Unit: 2121

further compares ( at 10 ) the frequency of the reference pulse train ( output of 82 ) with the frequency of the feedback pulse train ( output of 60 ); generates a control signal based on the comparison (output of 31 ); and provides the control signal as an input to the target system.

Hsieh teaches comparing pulse trains and generating a control signal in response to the comparison. See figure 1 and note elements 10, 30, 31, 60, 82 and their description. Also note that the frequency output of element 82 is dependent on the control signal output by element 70 and that the pulse output of element is a function of time ( varies with time ).

Hsieh however does not state that the leading edges of the pulses are used by the phase comparator to determine the error.

Long in col. 10, lines 61-65; and O'Sullivan in col. 4, lines 59-65; teach comparing the leading edges of pulse trains for ease in determining the phase error.

It would have been obvious to one of ordinary skill in the art to modify Hsieh in view of Long or O'Sullivan and use the leading edges for ease in determining the phase error.

In regards to claims 3 and 5, element 21 of Hsieh generates a pulse train (+ or - ) that represents the error between the pulse trains. Note figures 6A- 7C.

In response to applicant's arguments claim 2 only requires that the leading edges be substantially aligned not actually aligned as applicant argues. Further to perform phase detection inherently requires that the signals be substantially aligned so that the phase difference can be determined.

Art Unit: 2121

In response to applicant's arguments about the cost, space requirements, and noise reduction. The simple choice of whether the circuitry of Hsieh in view of either Long or O'Sullivan is implemented using a microprocessor or discrete circuitry can have a major impact on the space requirement and cost. Further the power requirements to drive the step motor and the location of the control circuitry relative to the motor can dictate the space requirements and associated costs. As to the noise argument, the choice of the pulse rate used can have a major impact on the noise immunity given that a stepper motor is being used in Hsieh and RF (radio frequency) interference could be generated.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

*Steven R. Garland*

Steven R Garland

Examiner

Art Unit 2125

\*\*\*

April 4, 2002

*NP* Conferees

Leo Picard SPE Art Unit 2125

*PR* Paul Rodriguez Art Unit 2125

JOHN J MCARDLE JR  
LEXMARK INTERNATIONAL INC  
INTELLECTUAL PROPERTY LAW DEPT  
740 NEW CIRCLE ROAD NW  
LEXINGTON, KY 40550

**LEO PICARD**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2100**